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Feeding Resources for Goat Farming Practices in Southern Tamil Nadu

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Abstract **– Goat farming is an important occupation in rural poor and landless labourers of India. The research work was carried out in southern agro-climatic regions viz., Tirunelveli, Thoothukudi and Virudhunagar districts of Tamil Nadu to document the feeding resources available in goat farming. More than half of the goat farmers in the study area practised semi-intensive (63.33 per cent) system of rearing followed by extensive (33.33 per cent) and intensive system (3.34 per cent) for their goats. Majority of the goat farmers had non-descript goats (71.67 per cent) followed by Kodi adu (15 per cent) and Kanni adu goat breeds (13.33 per cent). It was observed that nearly 47.22 per cent of the goat farmers were supplementing green fodders to their goats. The percentage of farmers supplementing cultivated green fodders to buck, does, kids and to marketing stock were 9.44, 15.00, 13.89 and 8.89 per cent, respectively. The pooled average nutrient contents (% in DM basis) of various foilages availabe to the goats in terms of dry matter, crude protein, ether extract, total ash, nitrogen free extract, calcium, phosphorus, salt, sand and silica, gross energy (kcal/kg), acid detergent fiber and neutral detergent fiber were 27.99, 14.07, 20.44, 1.99, 11.18, 47.68, 1.38, 0.33, 1.09, 3.69, 3343.17, 34.05 and 38.40 per cent, respectively. Supplementation of homemade concentrate with locally available grains oil cakes and rice or wheat bran either provided individually or mixed with proportion was followed by 31.67 per cent of goat farmers. The nutrient content of naturally available foliages and tree fodders play a major role for the performance of goats rearing under extensive system of management.**

Keywords **– Goat Farming, Feed Resources, Management, Tamil Nadu.**

I. INTRODUCTION

Goat farming is an important occupation in rural landless labourers. Goats are considered as a mobile bank and often termed mortgage lifter for the weakest section of society and ray of hope in the areas where agriculture is not economically viable and ecologically sustainable. Tamil Nadu is endowed with two breeds of goats recognised by National Bureau of Animal Genetics Resources viz., Kanni adu and Kodi adu which are reared in different agro-climatic regions and showed great variation in production and reproduction performances (Acharya,1982). Due to shrinking of grazing land, maintaining the goats on grazing may not sustain and goat keeping should be gradually switched over to strategic semi-intensive and intensive system of management.

II. MATERIALS AND METHODS

The study was carried out in southern agro-climatic regions viz., Tirunelveli, Thoothukudi and Virudhunagar districts of Tamil Nadu to document the feeding practices adopted by goat farmers. The villages were selected in consultation with the Department of Animal Husbandry of the Tirunelveli, Thoothukudi and Virudhunagar districts on the basis of goat population existing there and goat herds were selected at random. A total of 180 goat herds from 60 villages spread in thirty blocks in three districts (Tirunelveli, Thoothukudi and Virudhunagar) were selected using multi-stage random sampling technique. The details of different feed and fodder resources available in the study area was properly documented and statistically analysed.

III. RESULTS AND DISCUSSION

More than half of the goat farmers in the study area practised semi-intensive (63.33 per cent) system of rearing followed by extensive (33.33 per cent) and intensive system (3.34 per cent) for their goats. Majority of the goat farmers had non-descript goats (71.67 per cent) followed by Kodi adu (15 per cent) and Kanni adu goat breeds (13.33 per cent). It was observed from the table, *Azadirachta indica, Tamarindus indica, Leucaena leucocephala, Gliricidia sepium, Morinda pubescens, Ficus religiosa, Sesbania grandiflora, Acacia nilotica, Albizia lebbek, Phyllanthus reticulates and Moringa olifera* were the major tree fodders used in 16.67, 10.00, 9.44, 8.33, 13.33, 6.11, 5.56, 12.22, 5.56, 6.67 and 6.11 per cent, respectively for feeding the goats during grazing and provided by the goat farmers. The major foliages available in the grazing location of Tirunelveli district were *Cynodon dactylon, Brachiaria mutica, Echinochola colona, Acalypha indica and Phyllanthus reticulates* and they were present in 36.67, 33.33, 8.33, 11.67 and 10.00 per cent, respectively in grazing area. The major foliages available in the grazing location of Thoothukudi district were *Digitaria sanguinalis, Corchorus olitorius, Merremia emerginata, Trianthema portulacastrum and Ziziphus mauritiana* and they were present in 41.67, 35.00, 8.33, 10.00 and 5 per cent, respectively in grazing area. The major foliages available in the grazing location of Virudhunagar district were *Dactylotenium aegyptium, Digeria agvensis, Cyperus rotundus, Cassia auriculata and Abubilon indicum* as 31.67, 18.33, 13.33, 15.00 and 21.67 per cent, respectively in grazing area.

It was observed that nearly 47.22 per cent of the goat farmers were supplementing green fodders to their goats. The percentage of farmers supplementing cultivated green fodders to buck, does, kids and to marketing stock were 9.44, 15.00, 13.89 and 8.89 per cent, respectively. The practice of dry fodder supplementation was more prevalent in the study area. Nearly 44.44 per cent of the goat farmers were practicing the dry fodder supplementation to their goats. Percentage of goat farmers supplementing the dry fodders to buck, does, kids and marketing stock were 7.22, 12.22, 14.44 and 10.56 per cent, respectively. It was observed that 42.22 per cent of the goat farmers were practising the supplementation of tree fodders to their goats. The farmers supplementing tree fodders to buck, does, kids and marketing stock were 10.00, 11.67, 15.00 and 5.56 per cent, respectively.

Table 1. Systems of goat production (per cent) in southern Tamil Nadu

Particulars	Name of the District			Overall	Chi - square
	Tirunelveli	Thoothu kudi	Virudhu nagar		
Extensive	33.33 (20)	26.67 (16)	40.00 (24)	33.33 (60)	**3.07^{NS}**
Semi-Intensive	63.33 (38)	68.33 (41)	58.33 (35)	63.33 (114)	
Intensive	3.34 (2)	5.00 (3)	1.67 (1)	3.34 (6)	

Supplementation of homemade concentrate with locally available grains oil cakes and rice or wheat bran either provided individually or mixed with proportion was followed by 31.67 per cent of goat farmers. Farmers providing the home made concentrate to buck, does, kids and marketing stock were 9.44, 6.67, 8.33, 7.22 per cent, respectively.

Very few farmers in the study area were providing mineral mixture (6.11 per cent) to their goats by the advice of veterinary doctor to improve the growth performance of goats. The proportion of farmers providing mineral mixture supplementations to the goats were 2.22, 0.56, 1.67 and 1.67 per cent for buck, does, kids and marketing stock, respectively. The salt supplementation was followed by few goat farmers (8.89 per cent) in the study area. Category-wise salt was supplemented to buck, does, kids and marketing stock by 3.33, 1.67, 1.67 and 2.22 per cent of the farmers, respectively.

The average nutrient contents (% in DM basis) of various tree fodders offered to the goats in terms of dry matter, crude protein, crude fibre, ether extract, total ash, nitrogen free extract, calcium, phosphorus, salt, sand and silica, gross energy (kcal/kg), acid detergent fiber and neutral detergent fiber were 55.99, 14.86, 20.79, 4.02, 8.62, 45.59, 1.66, 0.27, 0.69, 1.19, 3876.04, 38.13 and 38.89 per cent, respectively. The pooled average nutrient contents (% in DM basis) of various foilages available to the goats in terms of dry matter, crude protein, ether extract, total ash, nitrogen free extract, calcium, phosphorus, salt, sand and silica, gross energy (kcal/kg), acid detergent fiber and neutral detergent fiber were 27.99, 14.07, 20.44, 1.99, 11.18, 47.68, 1.38, 0.33, 1.09, 3.69, 3343.17, 34.05 and 38.40 per cent, respectively.

The average nutrient contents (% in DM basis) of various supplements offered to the goats in terms of dry matter, crude protein, crude fibre, ether extract, total ash, nitrogen free extract, calcium, phosphorus, salt, sand and silica, gross energy (kcal/kg), acid detergent fiber and neutral detergent fiber were 90.36, 15.20, 16.83, 3.10, 6.26, 50.64, 0.84, 0.30, 0.45, 0.96, 3850.54, 26.70 and 32.97 per cent, respectively.

Kharat *et al.* (1980) analysed the chemical components of *Leuceana leucocephala* and found that the neutral detergent fibre, acid detergent fibre, hemicelluloses and cellulose contents were 46.30, 29.79, 16.51 and 16.67 per cent, respectively. In West Bengal, most of the tree leaves offered to the goats contained crude protein and crude fibre level varying between 8 to 15 and 1 to 25 per cent, respectively (Mandal, 1997). Radotra *et al.* (1998) analysed the chemical composition of concentrate ration fed to the Barbari, Kutchi and Sirohi kids maintained under intensive system of management at Jhansi. They reported that the crude protein, ether extract, crude fibre, total ash, nitrogen free extract, neutral detergent fibre, acid detergent fibre, hemicellulose and cellulose content (on dry matter basis) was 13.73, 3.34, 8.46, 6.51, 67.96, 42.60, 14.71, 27.02 and 9.38 percent, respectively.

Jain *et al.* (2000) reported that the Babul (*Acacia nilotica*) Umbrella thorn (*Acacia planiformis*) and Prosopis (*Prosopis juliflora*) were the major tree species found in south east coastal region of Tamil Nadu and these tree leaves are offered to the Kodi adu breed of goats. Crude protein contents were more in *Leucaena leucocephala* (20.10 per cent) than in *Grewia optiva* leaves (16.87 per cent). While neutral detergent fibre, acid detergent fibre and lignin content of *Grewia optiva* leaves were 41.18, 45.49 and 2.76 per cent, respectively and found to be higher than other tree leaves (Singh and Gupta, 2008). Cheema *et al.* (2011) reported that the tree leaves were rich in crude protein and total digestible nutrients which can meet out the nutritional requirements for goats. By analysis of chemical composition of lucern hay, Mohan *et al.* (2012) found that the crude protein, ether extract, crude fibre, nitrogen free extract, neutral detergent fibre, acid detergent fibre, hemicellulose and ash content was 18.18, 1.95, 25.16, 35.32, 40.19, 30.77, 10.22 and 9.32 per cent, respectively.

Singh *et al.* (2009) reported that the major fodders available for Gowhilwadi goats in the grazing area in Orissa were Kherjari (*Prosopis cineraria*), Kheri (*Acacia Senegal*) Neem (*Azadirachta indica*), Siris (*Albizia lebbek*), Babul (*Acacia nilotica*), Papal (*Ficus stea*) Bargad (*Ficus bengalensis*) and Subabool (*Leucaena leucocephala*). Nutritional evaluation of some fodder tree leaves was done by Azim *et al.* (2011). They reported that the *Acacia nilotica, Albezzia lebbeck Ziziphus mauritiana, Prosopsis cineraria* and *Ficus religiosa* were the common tree fodders fed to the goats by the farmers and *Acacia nilotica* was the major tree fodders and the nutrient contents as DM and CP were 53.43 and 16.26 per cent (on DM basis). Nutrient content of most of the tree fodders fell within the above range and found sufficient for goats.

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Table 2. Nutrient content of common foliages available for feeding of goats in southern Tamil Nadu

Name of the fodder		Nutrient contents (% in DM basis)												
Scientific name	**Common name**	**DM**	**CP**	**CF**	**EE**	**Total ash**	**NFE**	**Ca**	**P**	**Salt**	**SS**	**GE (kcal/kg)**	**ADF**	**NDF**
Cynodon dactylon	Bremuda grass	27.67	10.68	28.82	1.58	10.46	51.54	0.60	0.20	0.97	7.24	3461.00	65.23	58.67
Brachiaria mutica	Para grass	26.10	15.06	22.76	1.45	10.65	49.92	0.85	0.26	0.77	4.08	3529.00	47.22	51.45
Echinochola colona	Wild rice weed	18.89	15.24	23.79	2.3	9.25	50.58	1.2	0.32	2.71	1.06	3492.00	35.44	42.43
Acalypha indica	Khohala	26.78	15.5	21.81	2.53	14.12	53.96	1.95	0.6	0.77	0.31	3232.00	32.35	36.54
Phyllanthus reticulatus	Panjoli	24.56	12.14	23.96	5.89	5.87	47.86	1.32	0.20	0.36	1.46	3493.00	49.54	53.23
Digitaria sanguinalis	Crab grass	21.33	12.65	22.98	2.78	22.02	60.43	1.60	0.43	0.24	9.90	3086.00	32.56	43.23
Corchorus olitorius	Jew's mallow	21.67	18.73	12.96	0.55	11.86	44.10	1.79	0.42	0.73	0.96	3720.00	16.43	13.22
Merremia emerginata	Musakani	22.57	15.95	16.32	1.12	13.92	47.31	1.35	0.83	0.97	20.63	2780.00	19.45	16.52
Trianthema portulacastrum	Horse purslane	16.55	13.58	12.58	1.14	13.56	40.86	0.48	0.28	1.73	0.7	2277.00	17.00	21.22
Ziziphus mauritiana	Beri	54.67	12.43	18.4	1.81	7.22	39.86	2.55	0.24	0.47	0.5	3667.00	46.78	51.44
Dactylotenium aegyptium	Crow foot grass	25.44	13.53	27.85	1.12	5.99	48.49	1.15	0.14	3.09	1.37	3341.00	45.67	52.17
Digeria agvensis	Amranthus	25.45	19.88	13.98	1.73	16.86	52.45	2.04	0.35	1.16	0.95	3296.00	14.56	18.23
Cyperus rotundus	Yellow nut sedge	16.77	8.85	28.065	1.075	10.27	48.26	0.50	0.2	1.91	5.435	3441.50	21.44	31.23
Cassia auriculata	Tanners cassia	56.78	15.06	12.58	2.61	6.93	37.18	2.05	0.15	0	0.22	3774.00	43.20	52.12
Abubilon indicum	Indian abubilon	34.61	11.77	19.74	2.21	8.72	42.44	1.25	0.28	0.48	0.52	3558.00	23.89	34.33
Mean		**27.99**	**14.07**	**20.44**	**1.99**	**11.18**	**47.68**	**1.38**	**0.33**	**1.09**	**3.69**	**3343.17**	**34.05**	**38.40**
SE		**3.14**	**0.75**	**1.49**	**0.33**	**1.14**	**1.56**	**0.16**	**0.05**	**0.23**	**1.42**	**100.38**	**3.92**	**3.95**
Maximum		**56.78**	**19.88**	**28.82**	**5.89**	**22.02**	**60.43**	**2.55**	**0.83**	**3.09**	**20.63**	**3774.00**	**65.23**	**58.67**
Minimum		**16.55**	**8.85**	**12.58**	**0.55**	**5.87**	**37.18**	**0.48**	**0.14**	**0.00**	**0.22**	**2277.00**	**14.56**	**13.22**

IV. Summary and Conclusion

On analysis, the average dry matter and crude protein contents of the locally available foliages (on dry matter basis) offered to the goats were 27.99 and 14.07 per cent, respectively The foliages had less dry matter since they are available in a fresh form to the goats. Though different varieties of fodders are available in the study area, *Acacia* species are found to be the common one utilised by goats throughout the country. This can be also taken otherwise that wherever *Acacia* species is abundant the farmers are choosing goats for their livelihood. It is peculiar to note that the foliages available in one district were not seen in other districts. This indicates the diversity in the foliages of southern agro-climatic region of state, which is the strength and advantage of these places for goat rearing. The average dry matter and crude protein content (per cent DM basis) offered through tree fodders to the goats were 55.99 and 14.86 per cent, respectively.

Where grazing is not available during rainy days, goat farmers were feeding homemade concentrate to the goats to meet out the nutrition requirements. The average nutrient content (% in DM basis) of various supplements indicated that they were having sufficient dry matter (90.36 per cent in feed ingredients and 55.99 per cent in green supplements) and crude protein (15.20 per cent in feed ingredients and 14.86 per cent in green supplements). It was concluded that the nutrient content of naturally available foliages and tree fodders play a major role for the performance of goats rearing under extensive system of management. Variety of foliages and tree fodders in the grazing area has to be identified for the estimation of its nutrient contents may be helpful to the goat farmers.

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